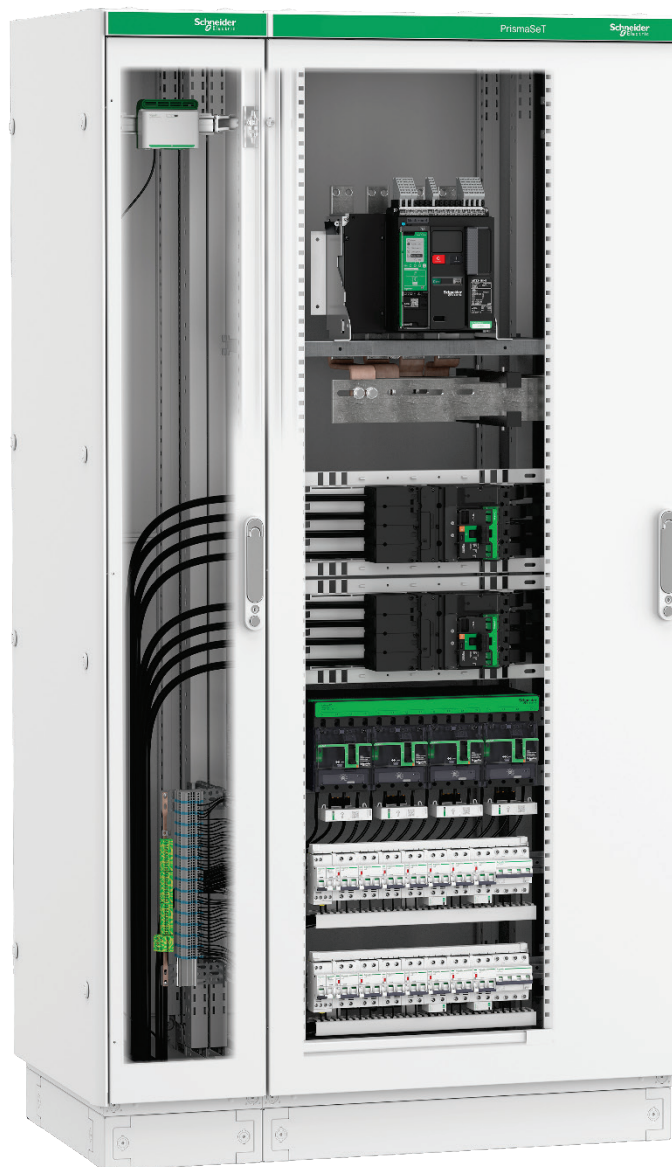# PowerLogic HeatTag Installation in PrismaSeT

Implementation and Commissioning Guide

Schneider Electric

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1. Safety Information

1.1. Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it.
The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed

This is the safety alert symbol. It is used to alert of potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death

---

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

1.2. Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid hazards involved.

2. About the Document

2.1. Purpose of the Document

This guide is dedicated to PowerLogic™ HeatTag installations for PrismaSeT S Wall Mount, PrismaSeT G / PrismaSeT L Wall Mount and Floor standing, PrismaSeT P / PrismaSeT M, and PrismaSeT HD low voltage switchboards for early detection of cable overheating.

The purpose of this guide is to:

- Support engineering and tendering teams during the quotation phase to calculate the correct installation of HeatTag sensors and, particularly, the quantity of different devices (such as sensors, gateways, and power supplies)
- Support panel builders during the installation phase, by giving generic rules and recommendations regarding the positioning of these devices in the cubicles

The guide covers design, installation, wiring, settings and functional testing of connected devices and their digital architectures.

Note: The rules and recommendations given in this guide are valid for PrismaSeT S, G, L, P, M, and HD low voltage switchboards. When used in other contexts, the operation and performance of the solution may vary.

The rules and recommendations apply to implementation of digital architectures and the related devices listed in chapter "1.2 Scope of the document". Settings are limited to the key communication parameters. For implementation and settings of the electrical functionalities of the devices, please refer to the User Guides for the devices.

2.2. Scope of the Document

2.2.1. Technology and Device Ranges

The architectures presented in this guide are built with the following devices:

- PowerLogic™ HeatTag wireless sensor
- EcoStruxure™ Panel Server wireless concentrator and gateway

2.2.2. Architecture Principles

Ethernet and wireless communication are used in the architectures presented in this document.

2.2.3. Communication Protocols

Modbus TCP/IP, Wi-Fi and IEEE 802.15.4 communication protocols are used in the proposed architectures.

2.2.4. Edge Control and Cloud Solutions

This guide covers installation up to the gateway level. It does not include guidance regarding edge control software, or cloud solutions, like the Energy Management System. However, this solution can be utilized with edge control software. Contact the local Schneider Electric representative for more information regarding what is available in each country.

2.3. Validity

This document is valid for wireless architectures utilizing HeatTag and EcoStruxure Panel Server.

This document describes topologies and performances, available with the following firmware versions of the devices:

Device name	Part number	Firmware version
PowerLogic™ HeatTag	SMT10020	≥ SV2.2.9
EcoStruxure™ Panel Server Entry	PAS400	≥ V001.006.000
EcoStruxure™ Panel Server Universal	PAS600	≥ V001.006.000
EcoStruxure™ Panel Server Advanced	PAS800	≥ V001.006.000

Table 1: Firmware version

Note: The latest EcoStruxure Panel Server firmware versions are available on Schneider Electric country websites.
The HeatTag firmware is not to be updated.

2.4. References

The following table lists the documents which can be used to become familiar with the content of this guide.

Document name	Reference
PowerLogic™ Energy and Power Meters for Panel Builders - Catalog	PLSED310126EN
PowerLogic™ HeatTag - User Guide	DOCA0171EN
PowerLogic™ HeatTag - Instruction sheet	MFR5173801
EcoStruxure™ Panel Server - User Guide	DOCA0172EN
EcoStruxure™ Panel Server Entry - Instruction Sheet	NNZ76760
EcoStruxure™ Panel Server Universal - Instruction Sheet	GDE74119
EcoStruxure™ Panel Server Advanced - Instruction Sheet	JYT24469
EcoStruxure™ Panel Server Antenna - Instruction Sheet	NNZ58425
EcoStruxure™ Panel Server Entry - Firmware Release Notes	DOCA0249EN
EcoStruxure™ Panel Server Universal - Firmware Release Notes	DOCA0178EN
EcoStruxure™ Panel Server Advanced - Firmware Release Notes	DOCA0248EN
EcoStruxure™ Panel Server - Cybersecurity Guide	DOCA0211EN
Wireless Communication Architectures with EcoStruxure™ Panel Server - Design Guide	DOCA0289EN
EcoStruxure™ Panel Server - Modbus File	DOCA0241EN

Table 2: Reference Documents

2.5. Glossary

The following terms may appear in this document:

Term	Description
EPC	EcoStruxure Power Commission
FU	Functional Unit
IEEE 802.15.4	Standard for Low-Rate Wireless Networks
IP	Ingress Protection
PAS	EcoStruxure Panel Server
PoE	Power over Ethernet
RF	Radio Frequency
RSSI	Received Signal Strength Indicator
MCCB	Molded Case Circuit Breaker

Table 3: Glossary

2.6. Prerequisites

The following prerequisites are recommended for correct implementation of the architecture described in this guide. This applies to:

- The networks and communication protocols used in the architectures:
  - IEEE 802.15.4 communication
  - Modbus TCP/IP or Wi-Fi network
- The devices used in the architectures:
  - PowerLogic HeatTag wireless sensor
  - EcoStruxure Panel Server (Entry, Universal and Advanced Panel Server)
  - The Panel Server Antenna is needed in some architectures
  - Power Supply for HeatTag and Panel Server
- Software used for the solution:
  - EcoStruxure Power Commission (EPC)

2.7. Device Description

2.7.1. PowerLogic HeatTag

SMT10020

The HeatTag is a wireless sensor for the early detection of overheating wire connections or overheating cables (Ref: **SMT10020**).

The HeatTag sensor helps prevent damage to electrical switchboards by analyzing gas and particles in the air, sending alerts before any smoke or insulator browning.

The HeatTag sensor includes the following features:

- 3 levels of alert according to the criticality of the detected situation

- 11 levels of air quality index (0 to 10)

- Analysis of gas and micro-particles emitted by cable sheaths when overheating

- Measurement of temperature and humidity inside the switchboard

- Self-diagnostics

- Communication with Schneider Electric gateways including EcoStruxure Panel Server and PowerTag Link Integration in EcoStruxure software solutions.

For detailed information concerning this device, refer to **PLSED310126EN**.

⚠ **WARNING**
FIRE HAZARD
• Do not use the HeatTag sensor as a safety device.
• Do not disable the equipment's other monitoring and safety devices.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

2.7.2. EcoStruxure Panel Server

EcoStruxure Panel Server is a Wireless Concentrator and Modbus Gateway (Ref: **PAS400/PAS600/PAS600L/PAS800/PAS800L/PAS800P**).

Panel Server provides connection to edge control software such as EcoStruxure Power Monitoring Expert or EcoStruxure Building Operation, and to cloud applications such as EcoStruxure Asset Advisor and EcoStruxure Energy Hub.

Key features of the Panel Server include:

- All-in-one gateway to retrieve data from both wireless sensors and Modbus devices optimizing energy management solutions.

- Ease of commissioning with the EcoStruxure Power Commission tool, enabling device plug and play and auto discovery features.

- Ease of operation with user-friendly embedded webpages and data contextualization for more relevant analytics.

- Enhanced Cybersecurity, designed through a development Life Cycle in accordance with IEC 62443-4-1.

Equipped with multiple communication protocols (including Ethernet, IEEE 802.15.4, Bluetooth, Wi-Fi, and optional cellular routers), the Panel Server adapts to fast-evolving communication technologies.

For detailed information concerning this range of devices, refer to **PLSED310126EN**.

2.7.3. EcoStruxure Panel Server Antenna

The Panel Server Antenna (Ref: **PASA-ANT1**) can be used to extend the wireless network.

- It can be utilized with the Advanced Panel Server (**PAS800** / **PAS800L** / **PAS800P**) to extend the IEEE 802.15.4 network when connected on the IEEE 802.15.4 socket.

- It can be utilized with both the Universal (**PAS600/PAS600L**) and Advanced (**PAS800/PAS800L/PAS800P**) Panel Server to extend the Wi-Fi network when connected on the Wi-Fi socket.

The antenna comes with a 3 m cable.

3.   Architecture

To monitor the overheating of cables inside PrismaSeT low voltage switchboards, EcoStruxure Panel Server and PowerLogic HeatTag devices are required.
Only in certain cases the wireless antenna will also be required.

For the EcoStruxure Panel Server, the three following variants are considered:

- Entry Panel Server – **PAS400**
- Universal Panel Server – **PAS600**, **PAS600L**
- Advanced Panel Server – **PAS800**, **PAS800L**, **PAS800P**

3.1. Topology

EcoStruxure Panel Server access points communicate natively in Modbus TCP/IP and can be directly connected to any Ethernet network. Alternatively, the Panel Server Antenna can be used as a Wi-Fi Antenna, regardless of the Panel Server version.
However, the Panel Server Antenna can only be used as an IEEE 802.15.4 antenna with the Advanced Panel Server.

Two kinds of Ethernet topologies are possible, depending on the requirements of the communication architecture:

- A star communication network offers an architecture with high dependability.

- A daisy-chain architecture offers a competitive architecture.

In a star network, all Panel Servers are directly connected to a common central node (switch). In such a network, a cable problem isolates the device that links it to the switch, but only that device is isolated. All the other devices continue to function normally. If any device is inoperative, none of the other devices are affected. But if the switch is inoperative, the entire network suffers degraded performance or complete detected failure.

In a daisy-chain topology, there is no limitation to the number of Panel Servers. With this topology, an issue with an Ethernet cable or a Panel Server will affect all downstream Panel Servers. In Daisy Chain topology, the optional external antenna can only be used for IEEE 802.15.4 coverage extension and not Wi-Fi.
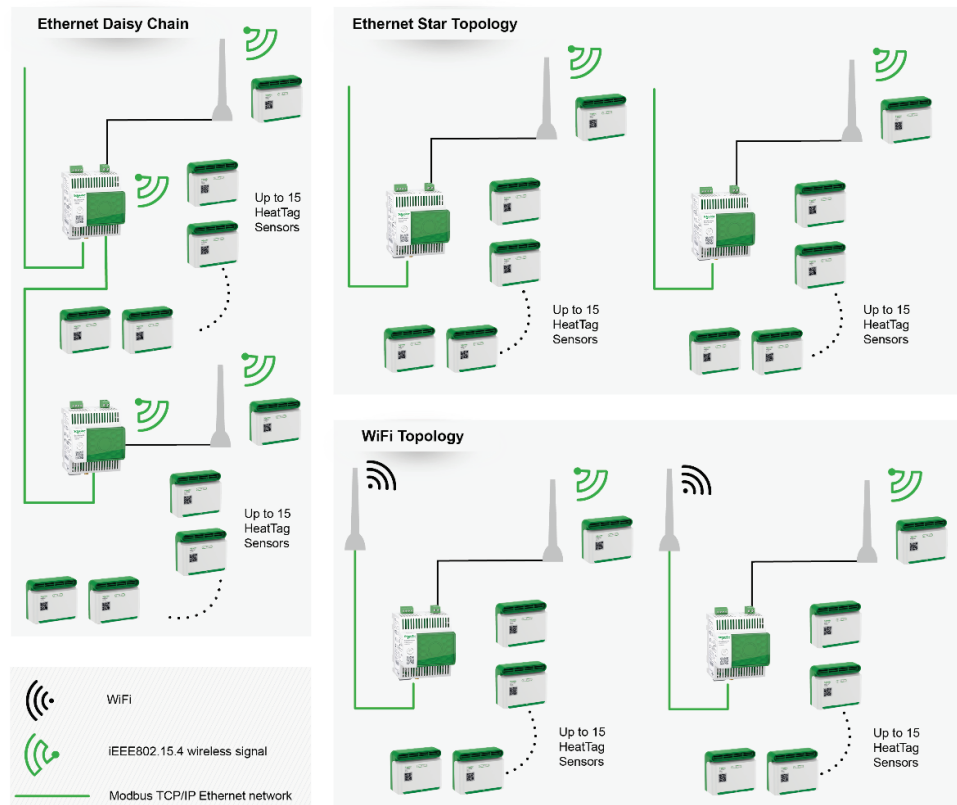
Illustration 1: Digital architectures for cable overheating early detection system*

*The Panel Server Antenna used as an IEEE 802.15.4 antenna is not always necessary. Refer to chapter "4.2 Distance and Switchboard Form of Internal Separation-Rules and Recommendations".

3.2. Maximum distance between HeatTag sensors and Panel Server

Switchboard Form	Panel Server	Panel Server Antenna	HeatTag
1, 2A, 2B, 3A, 3B, 4A, 4B	One Entry Panel Server, Universal Panel Server or Advanced Panel Server can cover a column (Max width 800 mm) in plus 2 columns on either side (maximum 5 with maximum 800 mm each)* If the switchboard is longer, consider utilizing Advanced Panel Server with a wireless antenna or adding additional Panel Servers	The maximum number of external antennas per Panel Server is 1. The length of the cable is 3 meters. The antenna can cover the column in plus 2 columns on either side. **Note:** Only Advanced Panel Server has an antenna socket for IEEE 802.15.4	The maximum number of HeatTag Sensors per Panel Server is 15.** This number is not altered if the Panel Server Antenna is added to the architecture.

Table 4: Components needed based on switchboard form of internal separation and size

*Note: The actual maximum distance is affected by a variety of factors.

Note: The number of devices is affected if other IEEE 802.15.4 devices are added. For more details regarding the number of devices, when other IEEE 802.15.4 devices are added, refer to **DOCA0178EN and **DOCA0248EN**.

Several factors affect whether the wireless signal between the Panel Server and the HeatTag is strong enough. Functional units and metal partitioning can restrict the signals. Their placement and thickness have a significant impact, while holes in the partitioning can let the signal through. The maximum distances listed above consider most of these factors, and can be used as generic rules, based on the multiple qualifications done in Schneider Electric switchboards.

In cases where it is not certain that the signal strength will be sufficient, it is recommended to use an Advanced Panel Server and add an antenna if needed.

It is always recommended to test the signal strength to verify that it is strong enough. Refer to chapter "5.3.3. Received Signal Strength Indicator (RSSI)".

4.   Installation Rules and Recommendations

⚡ ⚠ **DANGER**

HAZARD OF ELECTRIC SHOCK,
EXPLOSION OR ARC FLASH

- It is mandatory to read the detailed instruction sheet for the devices and to look at the devices to become familiar with them before attempting to install them, operate them, repair them or perform maintenance on them.
- Use appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, CSA Z462, NOM-029-STPS or local equivalent.
- Equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying the equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm the power is off.

Failure to follow these instructions will result in death or serious injury.

4.1. Power Supply

The HeatTag sensors installed in the different cubicles will be connected through IEEE 802.15.4 to Panel Server.

- HeatTag power supply: 110 - 277 V AC 50-60 Hz

Panel Server power supply:

- 110-277V AC/DC 50-60 Hz for **PAS400**, **PAS600** and **PAS800**

- 24V DC for **PAS600L** and **PAS800L**

- PoE (Power over Ethernet) for **PAS800P**

4.2. HeatTag Installation Rules

4.2.1. General Implementation Rules

NOTICE
HAZARD OF NON OPERATION
• Install HeatTag inside electrical panel or switchboard according to the following instructions.
• Install the covers on the equipment.
• Do not install HeatTag in a forced air ventilated enclosure.
• Do not switch the HeatTag power supply off and on, unless it is needed due to maintenance or equipment intervention.
Failure to follow these instructions can result in the loss of detection and communication functions.

- Generally, one HeatTag sensor is recommended to be installed per cubicle to mitigate the risk of fire caused by thermal runaway. It can be in the power cable compartment and/or auxiliary cable compartment

- HeatTag cannot be installed if the ambient temperature around the HeatTag is higher than 70°C

- HeatTag can be installed in cubicles with an IP range from IP30 to IP55 (only with natural ventilation)

- HeatTag can be installed in switchboards with Form 1, 2, 3 and 4

- HeatTag can detect the overheating of power cables and/or auxiliary cables (≥ 1.5 mm²)

Cable Type	Insulator
U1000 RV2	PVC (Polyvinyl - Chloride)
U1000A RV2	PVC (Polyvinyl - Chloride)
HO7RNF	EPR (Ethylene Propylene Rubber)
HO7VR	PVC (Polyvinyl - Chloride)
HO7VK	PVC (Polyvinyl - Chloride)
HO7VU	PVC (Polyvinyl - Chloride)
HO7Z1-K AS	LSZH (Low Smoke Zero Halogen - Unfused Polyolefin)
FS17-450/750 V	PVC (Polyvinyl - Chloride)
RHH or RHW-2 or USE-2	XLPE (Cross-Linked Polyethylene)
MTW or THWN or THHN	PVC (Polyvinyl-Chloride)
THHN or THWN-2 or MTW or AWM	PVC (Polyvinyl-Chloride)
XHHW-2 or SIS	XLPE (Cross-Linked Polyethylene)
THHN or THWN-2	PVC (Polyvinyl-Chloride)
RHW or RHH	XLPE (Cross-Linked Polyethylene)
XHHW-2	XLPE (Cross-Linked Polyethylene)
THW	PVC (Polyvinyl-Chloride)

Table 5: Types of cables already tested and validated with HeatTag

4.2.2. Monitoring of Power Cables

HeatTag can detect the overheating of power cables, for incomers and for feeders. The general rule is to install one HeatTag sensor in each cubicle that has power cables. It must be located in the cable compartment with the power cables (front access or rear access). The HeatTag must be located over the cables, close to the air exhaust.

- HeatTag must be installed just above the cable of the incomer

- HeatTag must be installed at the top of the cable compartment of the feeders

NOTICE
HAZARD OF NON OPERATION The HeatTag **must not** be installed at the bottom of the cubicle. **Failure to follow these instructions can result in the loss of detection.**

A HeatTag installed at the bottom of the cubicle will have zero function, as it will not be able to detect any particles.

Illustration 2: HeatTag must be installed just above the cable of the incomer

4.3. HeatTag Installation in PrismaSeT S

The general rule is to install one HeatTag in each cubicle which has cables. The HeatTag must be located at the top of the cubicle. It is forbidden to install it at the bottom, as the device will not be able to detect the gases (illustration 3).

The HeatTag must be installed on a DIN rail and can be installed on the same DIN rail as other devices. Ideally, it should be installed in the center of the DIN rail (illustration 4).
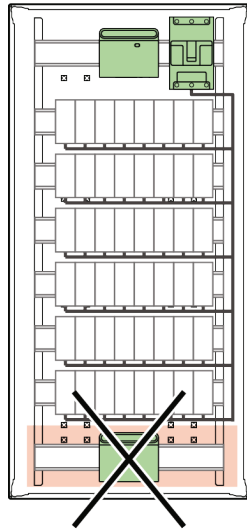

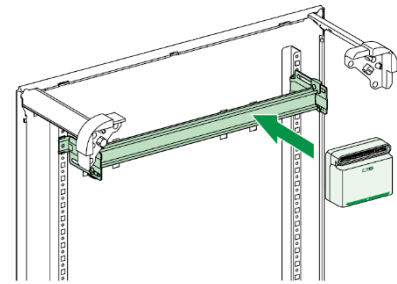Illustration 3: HeatTag installation in PrismaSeT S

Illustration 4: Installation placement in the center of DIN rail

4.4. HeatTag Installation in PrismaSeT G and PrismaSeT L

For PrismaSeT G and PrismaSeT L, the installation depends on whether there is an additional W300 cubicle, and the type of connection (top or bottom).

4.4.1. W600 or W800 Cubicle – without W300 Cubicle

There is one HeatTag per cubicle, and it is installed at the top of the cubicle (illustration 5). The installation is equivalent to PrismaSeT S.

It is forbidden to install it at the bottom, as the device will not be able to detect the gases. The HeatTag must be installed on a DIN rail and can be installed on the same DIN rail as other devices. Ideally, it should be installed in the center of the DIN rail.

If there is an MCCB plate mounted at the top of the cubicle, without any possibility to have the HeatTag above it, it shall be mounted just below (illustration 6).

If there are several adjacent W600 or W850 cubicles, it is necessary to install one HeatTag per W600 or W850 cubicle.
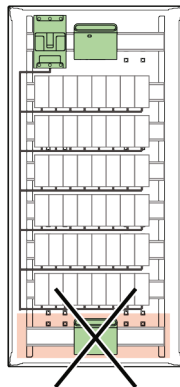

Illustration 5: NSXm (and/or MCB) on a DIN rail in the W600/W850

Illustration 6: NSX/NSXm on a mounting plate at the top of the W600/W850 (With or without incoming connection block)

4.4.2. W600 or W800 Cubicle – with additional W300 Cubicle

For the W600 or W800 cubicle with an additional W300 cubicle, it is possible to have a configuration with or without a partition between the W300 cubicle.

With Partitioning:

In case of a partition between the W600 or W850 cubicle and the W300 cubicle, it is necessary to have two HeatTag sensors, one in each compartment.

Without Partitioning:

If there is no partition between the W600 or W800 cubicle and the W300 cubicle, it is also possible to install only one HeatTag sensor. This device can be installed in the W600 or W850 cubicle, but also close to, or inside, the W300 cubicle. The placement depends on the type of connection (Top or Bottom), and on the installation of the incomer (on a DIN rail, on a mounting plate in the W600/W850 cubicle, or on a mounting plate in the W300 cubicle).

The HeatTag should be positioned according to the illustrations below, based on these incomer installations.
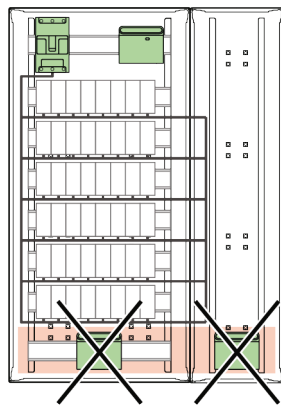
Top cable connection without partitioning:

Illustration 7: NSXm (and/or MCB) on a DIN rail in the W600/W850
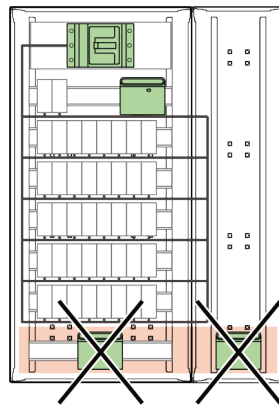

Illustration 8: NSX/NSXm on a mounting plate at the top of the W600/W850 (With or without incoming connection block)
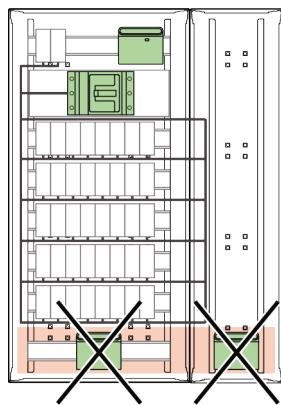

Illustration 9: NSX/NSXm on a mounting plate in the W600/W850 (Without incoming connection block)
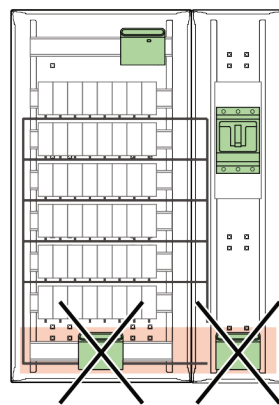

Illustration 10: NSX/NSXm on a mounting plate in the W300

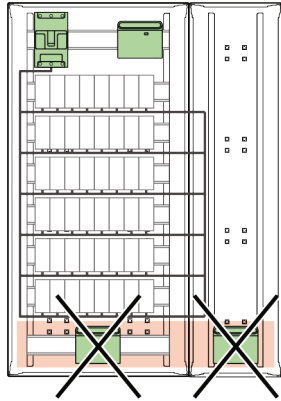**Bottom cable connection without partitioning:**

Illustration 11:
NSXm (and/or
MCB) on a DIN rail
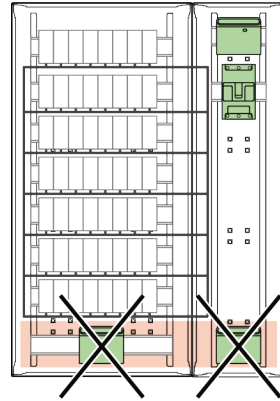in the W600/W850

Illustration 12:
NSXm (and/or MCB)
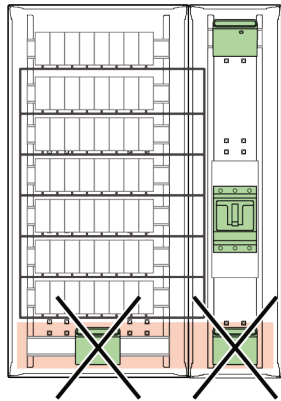on a DIN rail in
the W300

Illustration 13:
NSX/NSXm on a
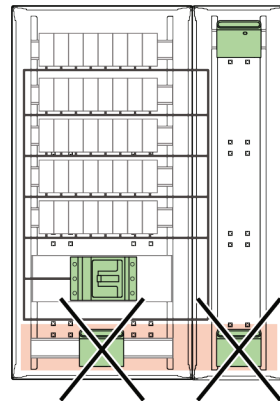mounting plate in the
W300

Illustration 14:
NSX/NSXm on a
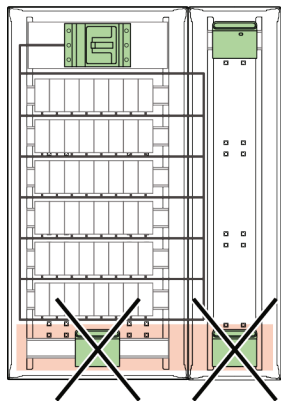mounting plate at the
bottom of the
W600/W850

Illustration 15:
NSX/NSXm on a
mounting plate at the
top of the W600/W850

4.5. HeatTag Installation in PrismaSeT P, PrismaSeT M, or PrismaSeT HD

For PrismaSeT P, PrismaSeT M, and PrismaSeT HD the installation depends on the framework, the type of connection (top/bottom, front/rear) and the type of devices.

The general rule is to install one HeatTag sensor in each cubicle containing cables. The HeatTag must be located at the top of the cubicle. It is forbidden to install it at the bottom, as the device will not be able to detect the gases.

The HeatTag must be installed on a DIN rail and can be installed on the same DIN rail as other devices. Ideally, it should be installed in the center of the DIN rail.

In the PrismaSeT P, M or HD cubicles, there are 3 types of frameworks:

| W300/W400 | W650/W800 | W(650+150) |

Illustration 16: PrismaSeT P, M, and HD Framework options

The W400, W650, W800 and W(650+150) widths are used for the installation of functional units with devices. These are considered the FU cubicles.

For front connection, the W300, W400, W650 and W800 widths are used for the installation of cables. These are considered the cable cubicles.

For rear connection, the cable cubicle has the same width as the FU cubicle.

For front connection:

1 HeatTag Sensor should be installed in each FU cubicle
(W400/W650/W800/W650+150).
If there is a W300/400 cable compartment, it is not compulsory to add an
additional HeatTag in the cable compartment, but it is possible.
If the cable compartment is W650/800, it is compulsory to add an additional
HeatTag.

FRONT CONNECTION				
Depth of 400 or 600mm				
Width	400	400+[300]	400+[400]	400+[650]	400+[800]
HeatTag Quantity	1	1*	2	2	2
Width	650	650+[300]	650+[400]	650+[650]	650+[800]
HeatTag Quantity	1	1*	2	2	2
Width	800	800+[300]	800+[400]	800+[650]	800+[800]
HeatTag Quantity	1	2	2	2	2
Width	(650+150)	(650+150)+[300]	(650+150)+[400]	(650+150)+[650]	(650+150)+[800]
HeatTag Quantity	1	2	2	2	2

* a second one in the cable compartment is optional
[xxx]: Cable Compartment

For rear connection:

1 HeatTag Sensor should be installed in each FU cubicle
(W400/W650/W800/W650+150).
In the cable compartment of W650/W800/W650+150, it is recommended also to
install another HeatTag.

The table below summarizes these recommendations:

REAR CONNECTION			
	Depth 400+[400]	**Depth 600+[400]**	**Depth 400/600+[>400]**
Width	400	400	400
HeatTag Quantity	1	1	2
Width	650	650	650
HeatTag Quantity	2**	2	2
Width	800	800	800
HeatTag Quantity	2	2	2
Width	(650+150)	(650+150)	(650+150)
HeatTag Quantity	2	2	2

** the second one in the cable compartment is optional
[xxx]: Cable Compartment

As an example, this layout has one incomer Top Connection, several feeders in the incomer cubicle, and a dedicated FU cubicle with a cable cubicle:
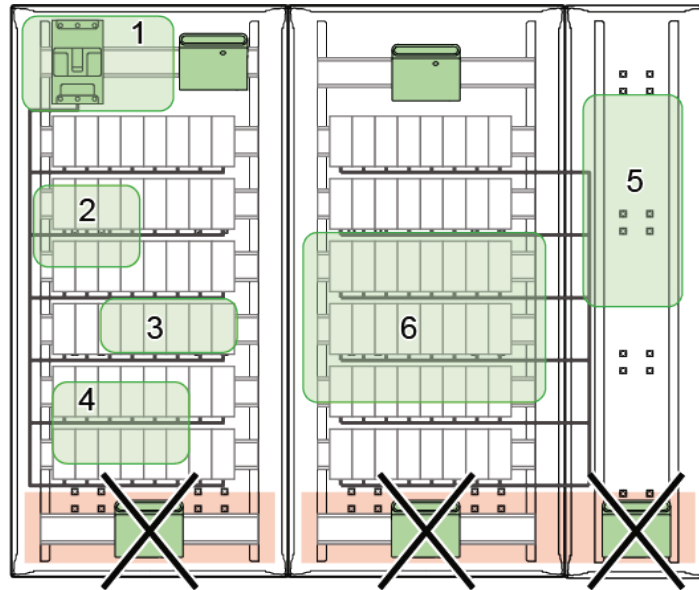
The proposed layout is as follows:

Illustration 17: Top Connection with several feeders in the incomer cubicle, and a dedicated FU cubicle with a cable cubicle

In this example, the first HeatTag covers zones 1, 2, 3 and 4 and the second HeatTag covers zones 5 and 6.

4.6. Panel Server Installation Rules

4.6.1. Panel Server Positioning in the Switchboard

Panel Server pollution performance:

- Pollution degree 2 for the **PAS400**, **PAS600** and **PAS800**
  with AC power supply

- Pollution degree 3 for the **PAS600L** and **PAS800L** (24 Vdc)

It is therefore recommended to use Panel Server devices with a 24V DC power supply unless the switchboards are located in rooms with pollution degree 2 or lower or equivalent protection measures are implemented.

Note: From the Radio Frequency standpoint, the solution to maximize performance is to install the EcoStruxure Panel Server close to the HeatTag sensors located at the top of the compartment, where there are fewer obstacles to Radio Frequency propagation. However, temperature in these compartments in some types of switchboards can be more stringent. Hence, a good compromise is to install the EcoStruxure Panel Server in a dedicated compartment as shown below, or similar.

iEEE802.15.4 wireless signal

EcoStruxure Panel Server

PowerLogic HeatTag

Illustration 18: EcoStruxure Panel Server position
in PrismaSeT Low Voltage Switchboard

4.6.2. Radio Frequency Channel

The wireless channel is obtained automatically (default setting). It is recommended to keep this setting. However, if other wireless devices are used in the same zone, the channel can be selected manually. Refer to **DOCA0172EN.**

4.6.3. Received Signal Strength Indicator (RSSI)

The quality of the Radio Frequency (RF) communication between the EcoStruxure Panel Server and each paired HeatTag sensor can be evaluated by using the Received Signal Strength Indicator (RSSI).

The RSSI (unit dBm) is affected by different factors, such as distance and metal partitions between the Panel Server and the HeatTag Sensor. Refer to chapter "4.2 Distance and Panel Form of Internal Separation-Rules and Recommendations" for details.

When checking for the RSSI, make sure that all panel doors are closed, otherwise the value may not be accurate.

IEEE 802.15.4 states that -85dBm is the minimum acceptable RSSI value. To be safe in case of minor modifications to the panel, it is best if the RSSI value is -75dBm or above.

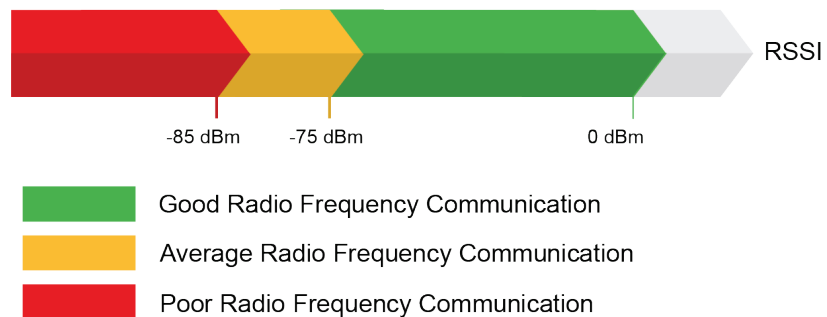|		
🟩	Good Radio Frequency Communication
🟨	Average Radio Frequency Communication
🟥	Poor Radio Frequency Communication

Illustration 19: RSSI levels

There are two ways to check the RSSI:

- Using EcoStruxure Power Commission software which indicates whether the RSSI signal is strong, medium or weak,

  o From the EcoStruxure Panel Server icon, select **"Wireless devices**", the signal strength is represented by the graphic and text as in the following example:

- Using the PAS Webpages to obtain values

  o From the EcoStruxure Panel Server webpages, select "**Maintenance > Device Communication > Wireless Devices > Wireless Network Indicator > Panel Server Indicator** "

  Measured value in text as in the following example:
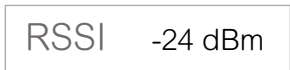
It is necessary to recheck the RSSI if any devices are added, removed, or change location.

4.7. Antenna Installation Rules

The external antenna has a 3 meter cable, which can be plugged into the Advanced Panel Server for extended IEEE 802.15.4 communication. The antenna itself is magnetic and is attached to the desired location using the magnet.

Refer to **NNZ58425** for more details.

Note: The antenna only works as an IEEE 802.15.4 antenna with Advanced Panel Server (**PAS800** / **PAS800L** / **PAS800P**).

5. Architecture Implementation and Commissioning

5.1. EcoStruxure Panel Server Modbus Table

The EcoStruxure Panel Server Modbus table is available in the document **DOCA0241EN**.

5.2. Configuration and Setting

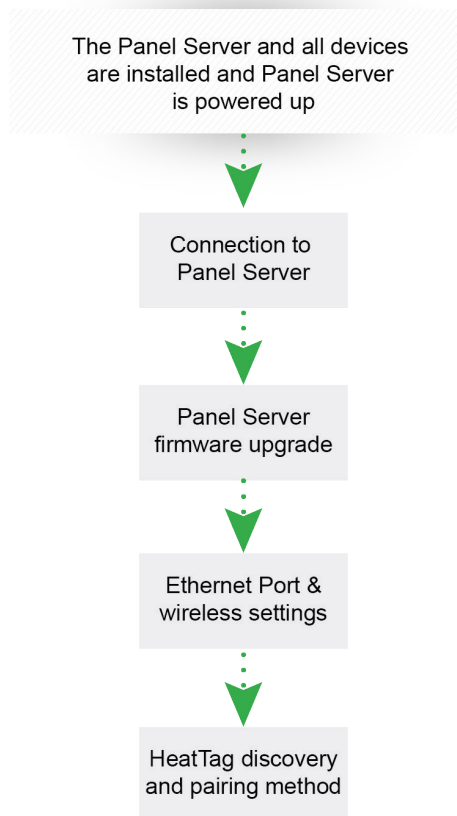The following chapters explain the different steps to configure this architecture, with an overview shown below:

Illustration 20: Configuration overview

The following chapters describe a usage scenario with a static IP address for the Panel server and explain how to establish communication with HeatTag.

The Panel Server can be commissioned using either:

- EcoStruxure Power Commission (EPC) software

- Panel Server webpages

It is recommended to use the EcoStruxure Power Commission (EPC) software to perform the commissioning of the Panel Server (PAS).

To install EcoStruxure Power Commission (EPC) software on a computer, proceed as follows:

- Click **here** to download the latest version of EcoStruxure Power Commission software.
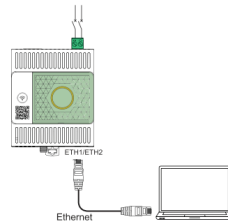
- Install EPC on a computer

The following are required for the configuration and settings:

- EPC software is installed with the latest version

- Devices are properly installed, connected, and powered
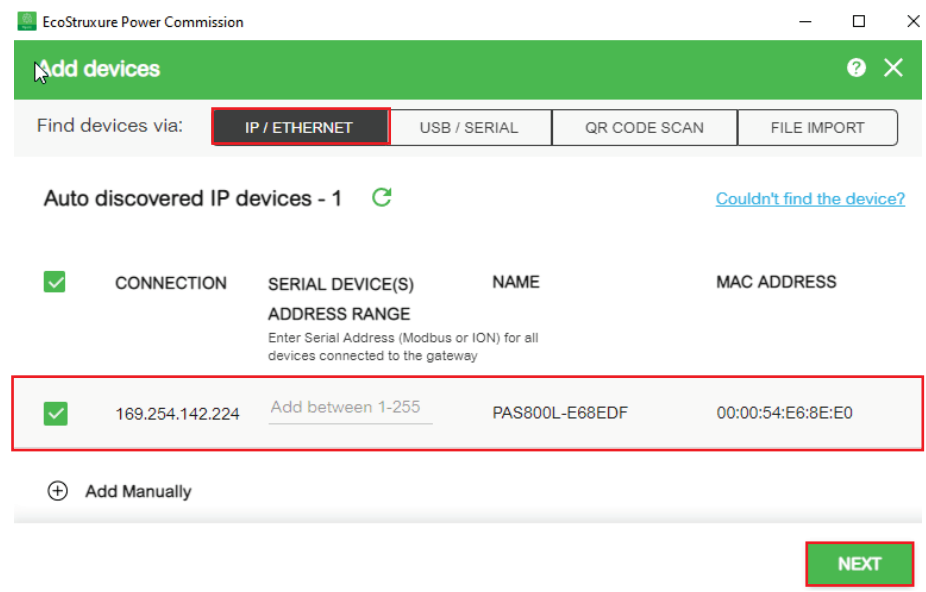
5.2.1. Connection to the Panel Server

To commission the PAS with EPC, proceed as follows:

1. Power on the EcoStruxure Panel Server and connect it to a computer.

To connect a computer to the PAS through Ethernet, connect an Ethernet cable between the computer and one of the Ethernet ports on the PAS (ETH1 or ETH2).

2. Launch the EPC

3. From EPC, click on "**Launch Device Discovery**"

4. Select Find device via "**IP/ETHERNET**"

5. Once Panel server appears in the list, click on "**NEXT**" then "**ADD DEVICE**"

6. Enter the project name and details, then click on "**NEXT**" and **"CONTINUE"** and follow the project creation steps

5.2.2. Panel Server Firmware Upgrade

There are two different ways to update the Panel Server firmware.

Option number 1 – with EPC

1. From the switchboard main screen click on **"CONNECT TO DEVICE"** then select **"Firmware"**

2. The installed firmware version of the device is displayed. If a newer version is available, the new version is displayed and **"Upgrade required"** is displayed under **"Recommended action"**

3. To upgrade the firmware, select the ✅ device then click on **"NEXT"**

4. Enter the **"username"** and **"password"** then click on **"UPGRADE"**

5. Follow the update process steps.
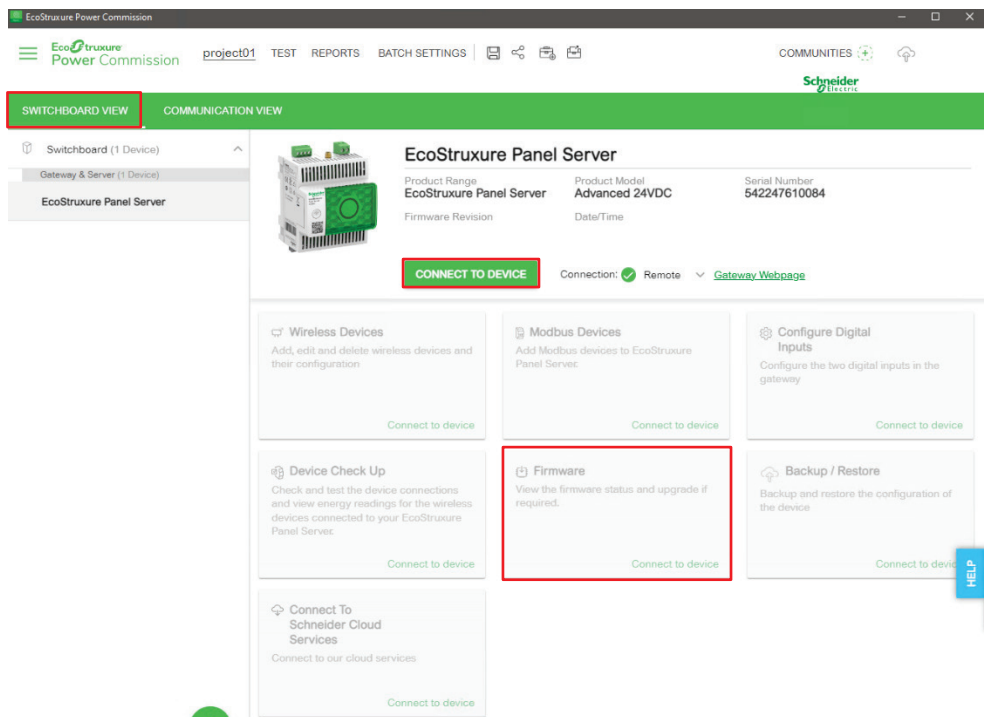
Option number 2 – with the Panel Server webpages

1. From the EcoStruxure Panel Server webpages,
   select **Maintenance > Firmware revision > Firmware update**

2. Import the firmware file and follow the instructions

3. Reboot the EcoStruxure Panel Server to update the firmware

4. After the reboot, check that the firmware version is the latest available, to make sure that the update was successful

5.2.3. Ethernet Port and Wireless Settings with EPC

1. On the top green banner, click on "**COMMUNICATION VIEW**".

2. Then, click on the ⚙ Icon to edit the device's communication settings on the Panel Server area.

3. On the "**Ethernet Setting**" configuration screen, select the relevant mode between "**2 switched ports**" and "**2 separated ports**".

4. Complete the Ethernet port fields. For more information regarding these options, refer to **DOCA0172EN.**
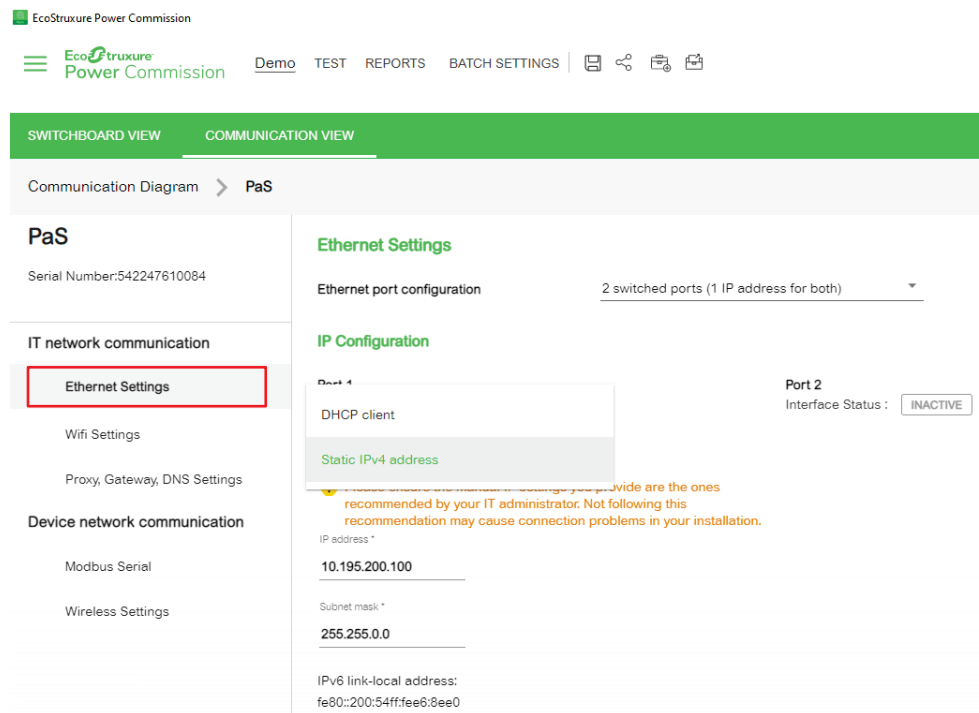
5. Select "**Wireless Settings**". Switch "**ON**" the "**Network status**" to activate the wireless. There are two possibilities, depending on the number of PAS.

   • For the architecture with **one PAS**, the default Panel Server wireless settings (communication periods and **Automatic** channel selection) can be used. In automatic mode, the panel server selects one of the 16 channels available (from 11 to 26), balancing communication loads to avoid disturbance.

   • For the architecture with two or more PAS, it is recommended to assign a channel to each PAS to improve the wireless communication.

6.   When the settings are complete click on "**APPLY**".

## 5.2.4. HeatTag Discovery and Pairing Method with EPC

Note: HeatTag uses mesh network technology, with messages forwarded to their destination via intermediate nodes (other HeatTag sensors), extending the range of the network beyond the range of an individual device's radio.

For this reason, it is recommended to add them one by one, moving from nearest to farthest from the Panel Server.

If the Panel Server is in the middle of the switchboard, it is recommended to pair the HeatTag sensors on one side of the switchboard and then on the other side.

If several Panel Servers are required to cover the full switchboard, it is necessary to pair each Panel Server separately with its allocated HeatTag sensors, to avoid mixing up the devices.

1. From the Switchboard main screen click on "**CONNECT TO DEVICE**" then select "**Wireless Devices**".
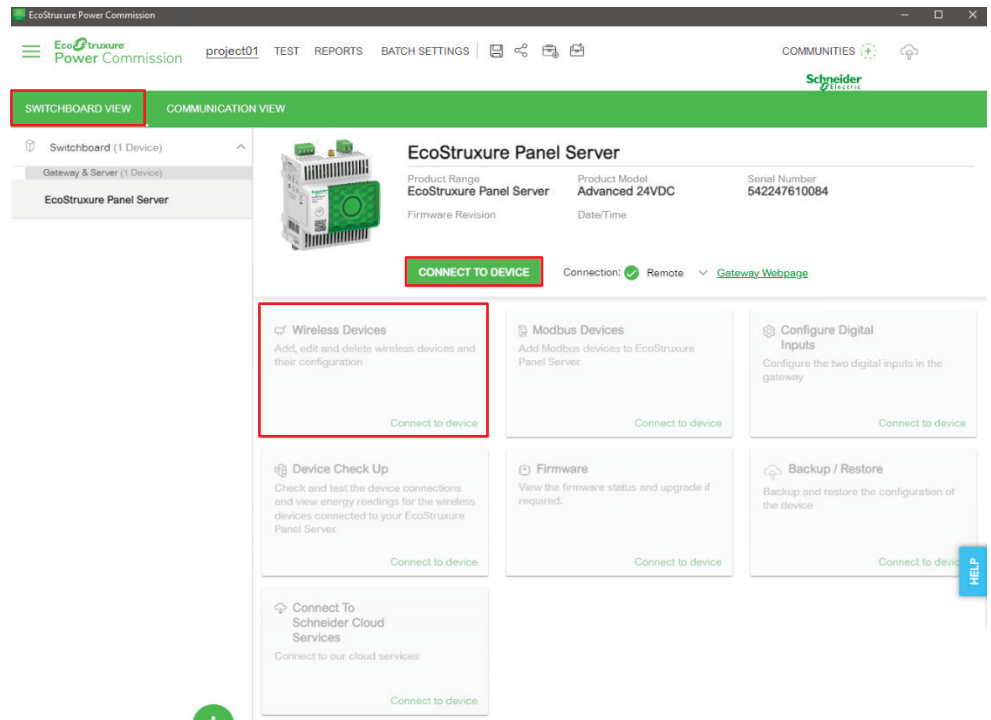
2. Power the HeatTag to be paired

3. Once the "**Network status LED**" is steady orange (unpaired). From EPC, select "**Automatic discovery**", then on the HeatTag, press the "**Operation button**" (Network status LED blinking orange).

A: Operation LED

B: Network status LED

C: Operation button
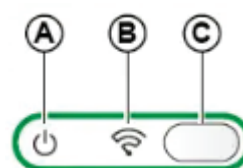
4. After a few seconds the Panel Server will find the HeatTag sensor and it will be possible to give it a label.

5. When HeatTag sensor has been added, click "**CONFIRM**"

6. The Panel Server implements a set of virtual Modbus register tables for each paired IEEE 802.15.4 wireless device. Each time a new wireless device is paired to the Panel Server, the device is automatically assigned a virtual Modbus server ID. The first paired wireless device assigned virtual server is ID 100. Each subsequent wireless device takes the next virtual ID, which is automatically incremented by one each time a new device is paired. (If Modbus serial line devices are also connected, make sure their Modbus server addresses are below 100 to avoid any conflicting addresses.)

It is also possible to update the virtual server ID as follows:

- Select the HeatTag and give it the new Modbus address (Virtual sensor ID) from 1 to 254.

- On the same screen, it is also possible to enter information to identify / locate the HeatTag.
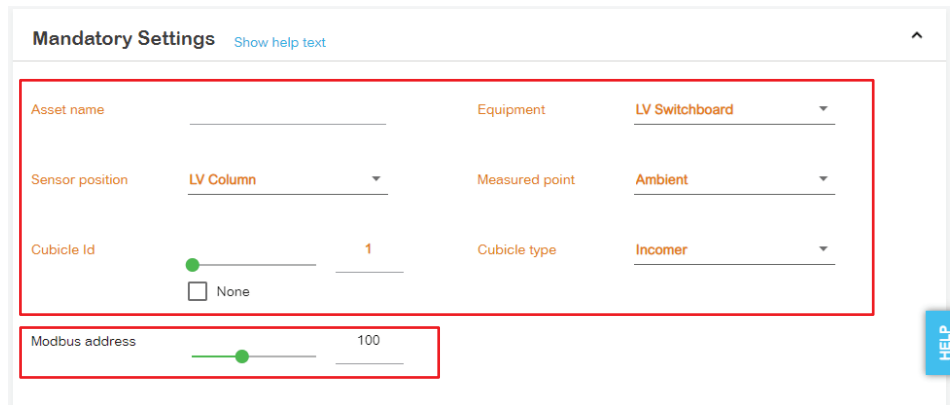
7. Save the project.

For more information regarding Configuration and settings, refer to **DOCA0172EN.**

5.2.5. HeatTag Alarms Configuration

HeatTag alarms can be managed through the PAS webpages:

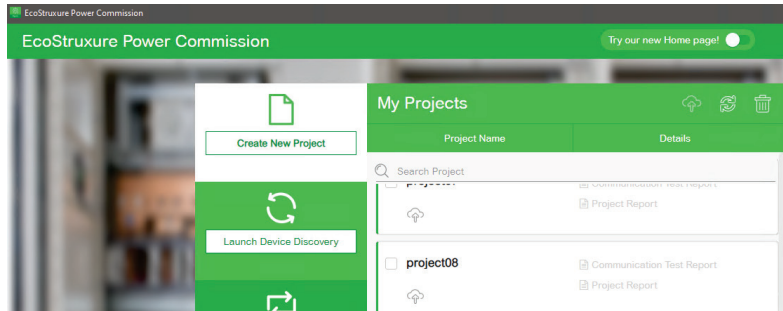1. Select the HeatTag and go to **Settings** > **Data management** > **Alarms**. An alarm can be activated or deactivated with the Enable alarm checkbox.
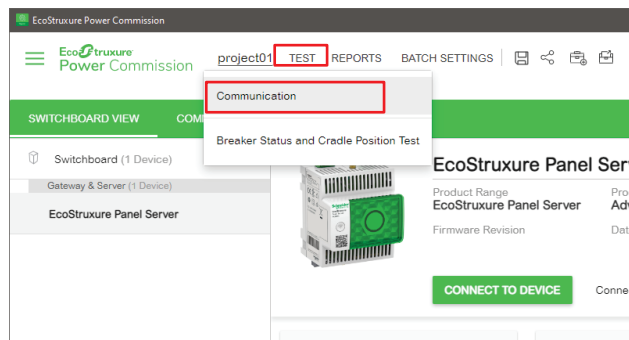
2. Then click on the disc symbol to save. When an alarm is enabled and becomes active, it is displayed in the page of the device on the "**Monitoring and Control"** webpage.

5.3. Testing

1. Open the project from the EPC main page

2. Select "Communication" in the **"TEST"** menu

3. The Communication Test page will open. Select the devices to perform the test and click on **"RUN TEST"**

A green check mark will appear in the result column if the communication test is successful, otherwise a red cross will be displayed. In this case, double check the HeatTag (refer to chapter "6.4 Troubleshooting") and run the test again.

Click on **"GENERATE REPORT"** to generate the communication test report and save it.

Number of devices tested: 2

PASSED: 2
FAILED: 0

Switchboard

Device name	Device Address	Connection	Module	Parameter Read	Result
EcoStruxure Panel Server	255	10.195.200.100	EcoStruxure Panel Server	Serial number 542247610084	**PASSED**
HT-01	100 RFID:0x804b50fffe9688a2	10.195.200.100	SMT10020	Serial number RN22252010053	**PASSED**

Communication Test Report Example

5.4. Troubleshooting

Different types of issues might occur during implementation. Some possible issues and their remedial actions are addressed below.

5.4.1. For HeatTag

Issue	Diagnostic	Action
The operation LED blinks fast red after a HeatTag self-diagnostics	Fan clogging detected in the HeatTag sensor	Clean the fan air inlet
The operation LED turns on red after a HeatTag self-diagnostics.	HeatTag sensor inoperative	Replace the HeatTag sensor

Table 6: HeatTag troubleshooting

To clean the HeatTag fan air inlet, proceed as follows
(requirements: dry air duster):

1. Check that the tamper-seal tapes are not damaged. If the tamper-seal tapes are damaged or missing, contact the Schneider Electric local representative

2. Disassemble the HeatTag sensor from the DIN rail

3. Place the HeatTag rear face on a flat surface, with the HeatTag fan air inlet visible

4. Position the dry air duster vertically (spray nozzle at the top), 5 centimeters (1.97 in) away from the fan air inlet, and spray dry air for 10 s onto the fan air inlet

5. Re-install the HeatTag sensor

6. Switch on the HeatTag sensor

7. Check that the HeatTag sensor is operating normally (operation LED steady green)

8. If the problem persists, repeat the cleaning procedure

9. If the problem persists, replace the HeatTag sensor

5.4.2. For Panel Server

Issue	Diagnostic	Action
Panel Server status LED is not lit	Panel Server is not powered, or power source is not stable	Power on the Panel Server or check power source quality
Panel Server status LED is blinking orange	Panel Server is in degraded health state	Check the Panel Server health state, which gives information regarding which internal component caused the Panel Server to start blinking orange. For example: • If Modbus is identified, then a Modbus- SL device may have been powered off or removed from EPC software, but EPC software did not remove the device as seen from the gateway • If IEEE 802.15.4 is identified, then a device may be powered off and stop communicating for a few cycles • If a local device is identified, then there may be an IPv4 address conflict
Panel Server status LED is steady red	Major malfunction	Contact the Schneider Electric service representative for assistance

Table 7: Panel Server troubleshooting

5.4.3. Panel Server Troubleshooting for Webpages and Communication

Issue	Diagnostics	Action
The HeatTag is not discovered by the Panel Server	• EcoStruxure Panel Server does not recognize the HeatTag	• Reset the HeatTag sensor to factory settings by pressing the operation button for more than 8 s until the network status LED turns steady red, then release the button.
The HeatTag is discovered by the Panel Server but does not communicate with the Panel Server	• The same Modbus server ID is set to two Modbus devices in the network • Incorrect device configuration settings	• Verify that a server ID is not used twice in the Modbus network • Verify that the HeatTag settings are set according to the Panel Server
Status of the HeatTag is not updated in the Panel Server webpages or EPC software	The HeatTag is powered off or has stopped communicating with the Panel Server (for example, if the HeatTag has been moved out of range) and has the status Not connected in the webpages	• Verify that the device is powered on • Verify that the wireless device is not installed out of range of the EcoStruxure Panel Server
Unable to browse the Panel Server webpages	Incorrect network configuration	• Verify that all IP parameters are correct • Verify that the Panel Server receives requests (ping the Panel Server in the DOS prompt. Type ping and Panel Server IP address. For example, ping 169.254.0.10) • Verify that all connection settings are correct in the browser Internet options
The Panel Server has lost communication with the HeatTag	Interference on the radio frequency channel	• Change the radio frequency channel that communicates between the HeatTag and the Panel Server in EPC software or Panel Server webpages

Table 8: Panel Server troubleshooting for webpages and communication

For more details, refer to **DOCA0172EN**, **DOCA0178EN** and **DOCA0248EN**

For more details regarding HeatTag - Operation and Network status LED, refer to **DOCA0171EN** and **MFR5173801**.

As standards, specifications, and design change from time
to time, please ask for confirmation of the information given
in this publication.

DOCA0338EN-00